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Introduction

Gudavi Bird Sanctuary (GBS) in Soraba taluk of Shimoga district is one of the less known bird sanctuaries of Karnataka. The sanctuary in addition to being one of the five known waterbird sanctuaries, is also the northern most in the state (Krishnaswamy 1988). Though the waterbird habitat at Gudavi was declared as a Bird Sanctuary during July, 1989, very little published information is available on the sanctuary—its habitat, fauna and flora.

Whatever little that has been written, are a preliminary research article (Shetty, 1991) and several popular articles in some of the local news papers and magazines. These articles so far have only managed to draw the attention of people, but do not give in greater details, the habitat status, its fauna and flora. This report though by no means comprehensive, intends to make a contribution in this direction.

Details of the sanctuary:

Gudavi Bird Sanctuary (14° 26'N 75° 01' E) is located at about 12km from Soraba and about 0.5 km south of the village Gudavi after which it has been named. It comes within the Kargal Forest Range. The main habitat in effect is a large tank with a raised bund, which, as per the stone inscription found on the bund stands for, was strengthened in the year 1940. The sanctuary encompasses a total area of 73.68 ha. with a water-spread area of about 33ha (Shetty, 1991). The water-spread area is bordered on its eastern and south-western sides by open moist deciduous forest.

The water-spread area itself has been demarcated into a smaller southern and a much larger northern (about two thirds of water-spread area) sectors by a raised bund. The river Verda flows about 0.5km. west of the sanctuary. The sanctuary is surrounded on its northern and southern sides by agricultural fields with paddy as the

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major crop. The water from the tank is known to be utilized for irrigating paddy fields on the western side. The sanctuary is not connected to the river Varda. It gets impounded with water during monsoon every year and invariably goes dry during very dry summers. In addition to the monsoon run-off from its catchment, the source of water impoundation is from the excess water flowing out of the surrounding paddy fields.

The water-spread area is in the form of a basin with several concentric zones of varying water depths. However, the area under zones of different water depths keep changing within a season due to evapotranspiration and due to utilisation of water for irrigation. As a result the dependent biota (aquatic vegetation/invertebrates) may also change (Chakrapani et al. 1990). Such a definite seasonal cycles and changing water depths have created a habitat which is highly dynamic and extremely heterogeneous at Gudavi Bird Sanctuary, thereby enhancing the productivity of the habitat for water birds.

Topography and soil

The sanctuary falls within the rainfall region of western Karnataka. The topography shows a gradual tilt towards east. The soil around the sanctuary is mainly lateritic in origin.

Vegetation

The sanctuary was once a part of a vast extent of dense moist deciduous forest.

However, the forest cover has now been thinned around low lying areas to make way for paddy cultivation. At present, sanctuary is surrounded on few of its sides with moist deciduous forest. The principal vegetation within the sanctuary (water spread area) is *Vitex leucoxylon*) other noticeable vegetation are *Pongamia glabra*, *Syzgium sp.*, *Ficus bengalensis*, *Terminalia sp.* *Mangifera indica*, *Dendrocalamus strictus*, *Tectona grandis*. The aquatic vegetation in the sanctuary is dominated by the growth of the floating leaves of *Nympha sp.* which carpet the surface of water. Among the submerged vegetation *Hydrilla sp.* is the major one.

Background of the Sanctuary

The bird sanctuary at Gudavi seems to have been an important breeding site for herons, egrets, spoonbills, cormorants and darters from well over a century back. Mr. Channabasappa an octagenarian from Hulemaradi (a village closeby) pointed out that the sanctuary was in existence even at the time when his grandfather was young. Until recently when the habitat was declared as a sanctuary, poaching appears to have been rampant during the breeding season of birds. At night people were known to swim into tank and collect eggs and capture nestlings and birds for food by climbing on to the nest trees. Often eggs were being collected in large gunny bags for sale. The trees were also being cut by the villagers for fuel wood and other purposes (Shetty, 1991). Between

1970 and 1985 the nesting birds numbers in the heronaries dwindled due to such an intense disturbances.

However, poaching and other disturbances stopped completely once the habitat received the status of a wildlife sanctuary and the breeding bird population have recovered dramatically since then.

Present status of avifauna

During the survey a total of 98 bird species falling under 15 orders and 36 families were sighted in and around the sanctuary (Appendix I). This included 29 species of waterbirds totally or partially dependent on water, of which 13 species were seen nesting with either eggs or young in their nests or were seen with fledglings (Appendix I). Of the waterbirds recorded at the sanctuary eleven more species (Little Grebe, Lesser Whistling Teals, Spotbill Duck, Cotton Teal, Red Wattled Lapwing, Coot, Purple Moorhen, Whitebreasted Waterhen and Kingfishers) are suspected to nest in and around the sanctuary.

Except for the Marsh Harrier and Common Sandpiper no other migrants were observed during the survey. A few visits to the sanctuary between December-March may reveal the full compliment of winter visitors.

Breeding birds at the sanctuary

Eleven species of birds (Appendix I) were observed nesting in the heronaries.

The White Ibis was the single most dominant species nesting at the time of the survey. An association analysis of species nesting on trees revealed that the White Ibis show a tendency to segregate and nest in pure colonies, while the Egrets, Herons and Spoonbills were rigidly communal and were seen nesting freely among other species. To certain extent, Darters and Cormorants too appeared to have segregated nesting colonies though they mixed freely among themselves on a nesting tree, but stratified their nesting zones vertically on a particular tree with the Darter and building their nests in the upper zone of the tree.

Night Heron and Pond Herons had their nest closest to the water (ground) level. However, White Ibis had its nests distributed almost at all levels. It showed a particular preference to nest on clumps of partly submerged bushes. None of the eleven species were seen nesting on trees outside the water spread area of the sanctuary. Also the nesting of these birds was seen only on trees of medium to dwarf in height. None of the tall trees in the sanctuary was seen being used for building their nests.

Two other species of water birds namely the Bronze-winged Jacana and Little Grebe were seen with fledglings. Coots were seen courting.

Distribution of nesting sites within the sanctuary

Greatest concentration of nesting by the eleven species was seen in the southern sector of the sanctuary. In the northern sector the nesting was concentrated in an area encompassing the eastern fringe and the southern fringe of the water-spread.

Bronzewing Jacana and Little Grebes seem to have nested in the northern sector of the sanctuary, among the emergent and floating vegetation or among the partially submerged bushes. As indicated by Mr. Ramappa (Watcher, wildlife division, KFD at the sanctuary), the Whistling Teals and Cotton Teals are known to nest in the hollows of trees found in the northern sector. The spotbill Duck is known

to nest among the emergent vegetation in the same sector.

Other observations

The trees within the water spread area of the sanctuary are known to be used for roosting by Egrets, Herons, Cormorants and Darters. Based on the detail count of the birds taken at the sanctuary and observations on the flights of birds returning to the roost at the sanctuary in the evening, we estimate that not less than 50,000 waterbirds to be in habiting the sanctuary. However, the KFD Watcher, at the sanctuary puts their number at around one lakh. The sparse forest cover around the water spread area and the adjoining paddy fields support a large number of land birds (Appendix I).

APPENDIX I

A checklist of the Birds of Gudavi Bird Sanctuary and its Environs

Order : PODICIPEDIFORMES

Family : Podicipedidae

- 1 *Podiceps ruficollis*-Little Grebe * +

Order : PELECANIFORMES

Family : Phalacrocoracidae

- | | | |
|-------------------------------------|---|----------------------|
| 2. <i>Phalacrocorax fuscicollis</i> | — | Indian Shag * + |
| 3. <i>Phalacrocorax niger</i> | — | Little Cormorant * + |
| 4. <i>Anhinga rufa</i> | — | Darter * + |

Order : CICONIFORMES

Family : Ardeidae

- | | | |
|----------------------------------|---|------------------|
| 5. <i>Ardea Purpurea</i> | — | Purple Heron * + |
| 6. <i>Ardea alba</i> | — | Large Egret * + |
| 7. <i>Ardeola grayii</i> | — | Pond Heron * + |
| 8. <i>Bubulcus ibis</i> | — | Cattle Egret * + |
| 9. <i>Egretta intermedia</i> | — | Median Egret * + |
| 10. <i>Egretta garzetta</i> | — | Little Egret * + |
| 11. <i>Nycticorax nycticorax</i> | — | Night Heron * + |

Family : Threskiornithidae

- | | | |
|---------------------------------------|---|----------------|
| 12. <i>Threskiornis melanocephala</i> | — | White Ibis * + |
| 13. <i>Platalea leucorodia</i> | — | Spoonbill * + |

Order : ANSERIFORMES

Family : Anedidae

- | | | |
|-------------------------------------|---|------------------------|
| 14. <i>Dendrocygna javanica</i> | — | Lesser Whistling Teal* |
| 15. <i>Anas poecilorhyncha</i> | — | Spotbill Duck * |
| 16. <i>Anas querquedula</i> | — | Garganey * |
| 17. <i>Nettapus coromandelianus</i> | — | Cotton Teal* |

Order : FALCONIFORMES

Family : Accipitridae

- | | | |
|-------------------------------|---|-------------------------|
| 18. <i>Milvus migrans</i> | — | Pariah Kite |
| 19. <i>Haliastur indus</i> | — | Brahminy Kite |
| 20. <i>Accipiter badius</i> | — | Shikra |
| 21. <i>Gyps bengalensis</i> | — | Whitebacked Vulture |
| 22. <i>Circus aeruginosus</i> | — | Marsh Harrier |
| 23. <i>Spilornis cheela</i> | — | Crested Serpent Eagle * |

Order : GALLIFORMES

Family : Phasianidae

- | | | |
|-------------------------------|---|-------------------|
| 24. <i>Francolinus picaus</i> | — | Painted partridge |
| 25. <i>Gallus sonneratii</i> | — | Grey Jungle Fowl |

Order : GRUIFORMES

Family : Rallidae

- | | | |
|----------------------------------|---|-------------------------|
| 26. <i>Amouornis phoenicurus</i> | — | Whitebreasted Watrhen * |
| 27. <i>Porphyrio porphyrio</i> | — | Purple Moorhen* |
| 28. <i>Fulica atra</i> | — | Coat * |

Order : CHARADRIIFORMES

Family : Jacanidae

- | | | |
|-------------------------------------|---|--------------------------|
| 29. <i>Hydrophasianus chirurgus</i> | — | Pheasant-tailed Jacana * |
| 30. <i>Metopidius indicus</i> | — | Bronzewinged Jacana * + |

Family : Charadriidae

- | | | |
|-------------------------------|---|-----------------------|
| 31. <i>Vanellus indicus</i> | — | Redwattleed Lapwing * |
| 32. <i>Actitis hypoleucos</i> | — | Common Sandpiper * |

Family : Laridae

- | | | |
|-------------------------------|---|---------------------|
| 33. <i>Chlidonias hybrida</i> | — | Whiskered Tern * |
| 34. <i>Sterna acuticauda</i> | — | Blackbellied Tern * |

Order : COLUMBIFORMES

Family : Columbidae

- | | | |
|-----------------------------------|---|------------------------------|
| 35. <i>Treron pompadora</i> | — | Geryfronted Green Pigeon |
| 36. <i>Treron phoenicoptera</i> | — | Southren Green Pigeon |
| 37. <i>Ducula badia</i> | — | Maroonbacked Imperial pegeon |
| 38. <i>Columba levia</i> | — | Blue Rock Pigaon |
| 39. <i>Streptopelia chinensis</i> | — | Spatted Dove |

Order : PSITTACIFORMES

Family : Psittidae

- | | | |
|------------------------------------|---|------------------------|
| 40. <i>Psittacula krameri</i> | — | Roseringed Parakeet |
| 41. <i>Psittacula cyanocephala</i> | — | Blossomheaded Parakeet |
| 42. <i>Psittacula comumboides</i> | — | Bluwinged Parakeet |

Order : CUCULIFORMES

Family : Cuculidae

- | | | |
|-------------------------------------|---|---------------------------|
| 43. <i>Eudynamus scolopacea</i> | — | Koel |
| 44. <i>Rhopodytes viridirostris</i> | — | Small Greenbilled Malkoha |
| 45. <i>Centropus sinensis</i> | — | Cucul |

Order : APODIFORMES

Family : Apodidae

- | | | |
|-----------------------------|---|-------------|
| 46. <i>Apus affinis</i> | — | House Swift |
| 47. <i>Cypsiurus parvus</i> | — | Palm Swift |

Order : CORACIFORMES

Family : Alcedinidae

- | | | |
|--------------------------------|---|----------------------------|
| 48. <i>Ceryle rudis</i> | — | Lesser pied Kingfisher * |
| 49. <i>Alcedo atthis</i> | — | Small Blue Kingfisher * |
| 50. <i>Halceyon smyrnensis</i> | — | Whitebreasted Kingfisher * |

Family : Meropidae

- | | | |
|-----------------------------|---|-----------------------|
| 51. <i>Merops orietalis</i> | — | Small Green Bee-eater |
|-----------------------------|---|-----------------------|

Family : Upupidae

- | | | |
|------------------------|---|--------|
| 52. <i>Upupa epops</i> | — | Hoopoe |
|------------------------|---|--------|

Order : PICIFORMES

Family : Capitonidae

- | | | |
|-----------------------------------|---|------------------------|
| 53. <i>Megalaima zeylanica</i> | — | Large Green Barbet |
| 54. <i>Megalaima rubricapilla</i> | — | Crimsonthroated Barbet |

Family : Picidae

- | | | |
|---------------------------------|---|--------------------------|
| 55. <i>Dinopium benghalense</i> | — | Golden backed woodpecker |
|---------------------------------|---|--------------------------|

Order : PASSERIFORMES

Family : Alaudidae

- | | | |
|---------------------------|---|---------------|
| 56. <i>Alauda gulgula</i> | — | Small Skylark |
|---------------------------|---|---------------|

Family : Hirundinidae

57. *Hirundo smithii* — Wiretailed Swallow
58. *Hirundo daurica* — Redrumped Swallow

Family : Laniidae

59. *Lanius schach* — Rufous-backed Shrike
60. *Lanius cristatus* — Brown Shrike

Family : Oriolidae

61. *Oriolus oriolus* — Golden Oriole

Family : Artamidae

62. *Artamus fuscus* — Ashy Swallow-Shrike

Family : Campephagidae

63. *Tephrodornis pondicerianus* — Indian Wood Shrike
64. *Coracias melanoptera* — Black-headed Cuckoo-shrike
65. *Pericroctus flammeus* — Scarlet Minivet

Family : Sturnidae

66. *Sturnus pagoderum* — Black-headed Myna
67. *Acridotheres tristis* — Common Myna
68. *Acridotheres fuscus* — Jungle Myna

Family : Corvidae

69. *Corvus splendens* — House crow
70. *Corvus macrorhynchos* — Jungle crow

Family : Irenidae

71. *Aegithina tiphia* — Common Iora
72. *Chloropsis cochinchinensis* — Gold-mantled Chloropsis

Family : Pycnonotidae

73. *Pycnonotus jocosus* — Red-whiskered Bulbul

74. *Pycnonotus cafer* — Redvented Bulbul
 75. *Pycnonotus luteolus* — Whitebrowed Bulbul
 76. *Hypsipetes madagascariensis* — Black Bulbul

Family : Muscicapidae

77. *Turdoides striatus* — Jugle Babbler
 78. *Turdoides affinis* — Whiteheaded Babbler
 79. *Muscicapa parva* — Redbreasted Flycatcher
 80. *Muscicapa albicollis* — Brown Flycatcher
 81. *Rhipidura latirostris* — Whitespotted Fantail Flycatcher
 82. *Cisticola juncidis* — Streaked Fantail Warbler
 83. *Prinia subflava* — Indian Wren Warbler
 84. *Orthotomus sutorius* — Tailor Bird
 85. *Phylloscopus trochiloides* — Greenish leaf Warbler.
 86. *Copsychus saularis* — Magpie Robin
 87. *Copsychus malabaricus* — Shama
 88. *Saxicola caprata* — Pied Bush Chat
 89. *Myiophonus horsfieldii* — Malabar Whistling Thrush

Family : Paridae

90. *Parus xanthogenyas* — Yellowcheeked Tit

Family : Motacillidae

91. *Motacilla caspica* — Grey Wagtail *

Family : Dicaeidae

92. *Dicaeum aglie* — Thickbilled Flowerpecker
 93. *Dicaeum erythrorhynchos* — Tickell's Flowerpecker

Family : Nectarinidae

94. *Nectarinia minima* — Small Sunbird

Family : Ploceidae

- | | | |
|--------------------------------|---|-------------------|
| 95. <i>Passer domestica</i> | — | House Sparrow |
| 96. <i>Ploceus philippinus</i> | — | Baya |
| 97. <i>Estrilda amandava</i> | — | Red Munia |
| 98. <i>Lonchura striata</i> | — | Whitebacked Munia |

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* Water bird species sighted within the limits of GBS

+ Species observed nesting or sighted with fledglings at GBS